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Tupelo

An American Wood

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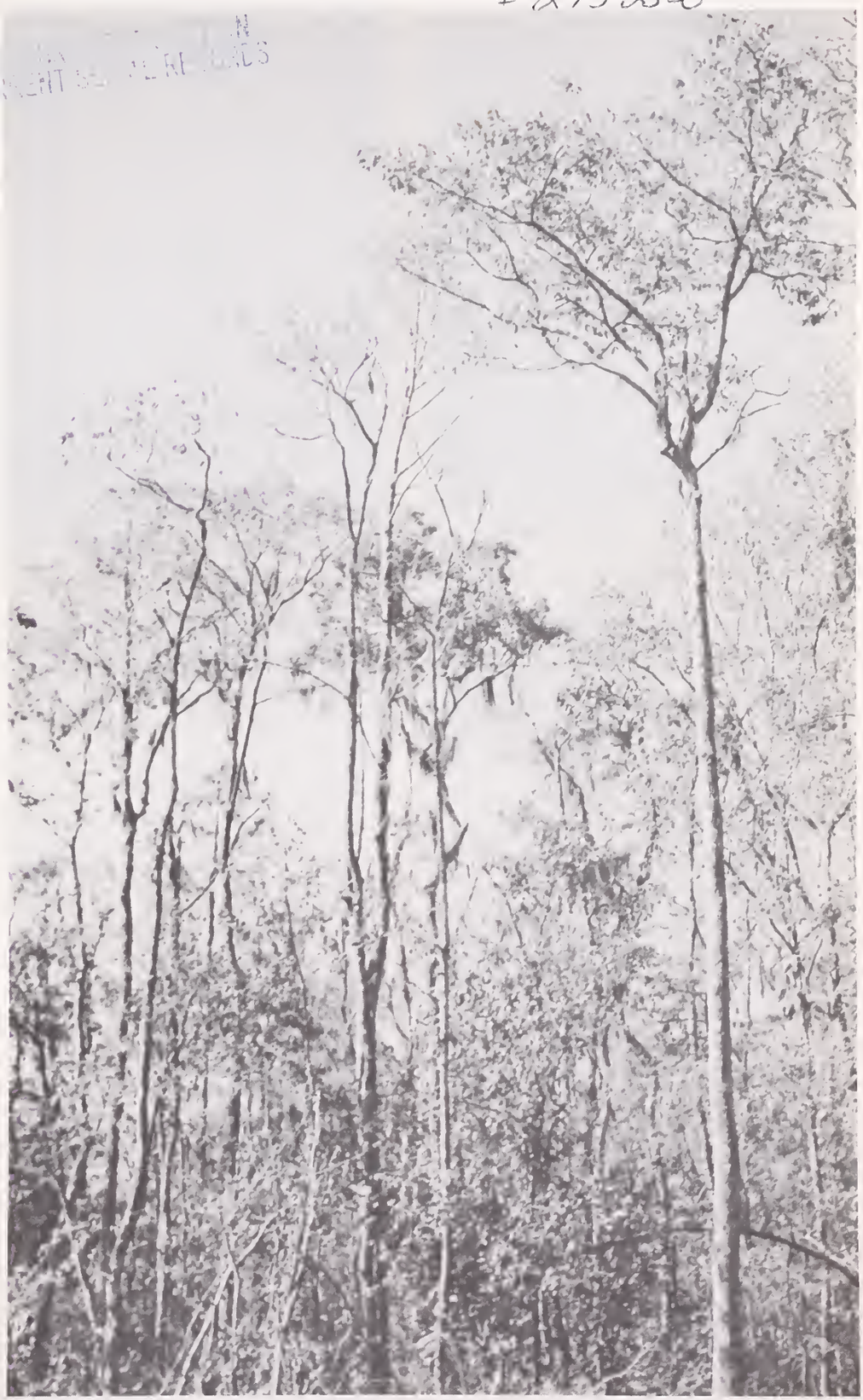
The species and varieties of tupelo that occur in this country are black tupelo, swamp tupelo, water tupelo, and Ogeechee tupelo. One or more members of the genus grow in all of the Eastern and Southern States and parts of the Central States. Black, water, and swamp tupelo are important commercially. Their woods are similar in appearance and each is difficult to distinguish from the others, even under a microscope. Tupelo wood frequently has interlocked grain and tends to warp when dried. Tupelo wood is used principally to make furniture and shipping containers.



F-464498

Tupelo

(Nyssa spp.)

Joseph R. Saucier [1]

The species and varieties of tupelo recognized in this country are: black tupelo (*Nyssa sylvatica* Marsh. var. *sylvatica*); swamp tupelo (*N. sylvatica* var. *biflora* [Walt.] Sarg.); water tupelo (*N. aquatica* L.); and Ogeechee tupelo (*N. ogeche* Bartr. ex Marsh.).

Distribution

Black tupelo has the widest range of the native tupelos. It grows from southwestern Maine west to New York, central Michigan, and Illinois and south to central Missouri, eastern Oklahoma and Texas, and southern Florida. It occurs in extreme southern Ontario, Canada, and is found in central and southern Mexico (fig. 1).

Black tupelo is adapted to a wide variety of sites. It survives as a shrub or scrubby tree on the dry eastern edge of the Great Plains, but develops into a tree 100 to 120 feet in height and up to 48 inches in diameter at breast height (d.b.h.) on the lower slopes and terraces in the Southeastern United States. In lowlands black tupelo makes its best growth on loamy, well-drained ridges of second or higher bottoms and on silty alluvial flats. It grows only sparingly in first bottoms. In uplands it develops best on moist lower slopes and in coves. The tree will stand shallow overflow or shallow pools resulting from winter rains, but apparently never grows on sites that are usually covered by standing water.

Black tupelo is moderately tolerant to shade and is not dominant in any major forest type, although it grows with a large number of other trees. In New England, Pennsylvania, New Jersey, and the Lake States, it is associated with yellow birch, sycamore, slippery and rock elms, and swamp white oak. In the central forest region it is associated with post oak, black oak, scarlet oak, chestnut oak, white oak, and northern red oak. In the southern lowlands it is an associate of the white oaks, red oaks, sugarberry, elm, and ash. Since it grows on drier sites, black tupelo is more susceptible to damage by fire than are the other species of tupelo. Hot fires cause severe mortality and cull.

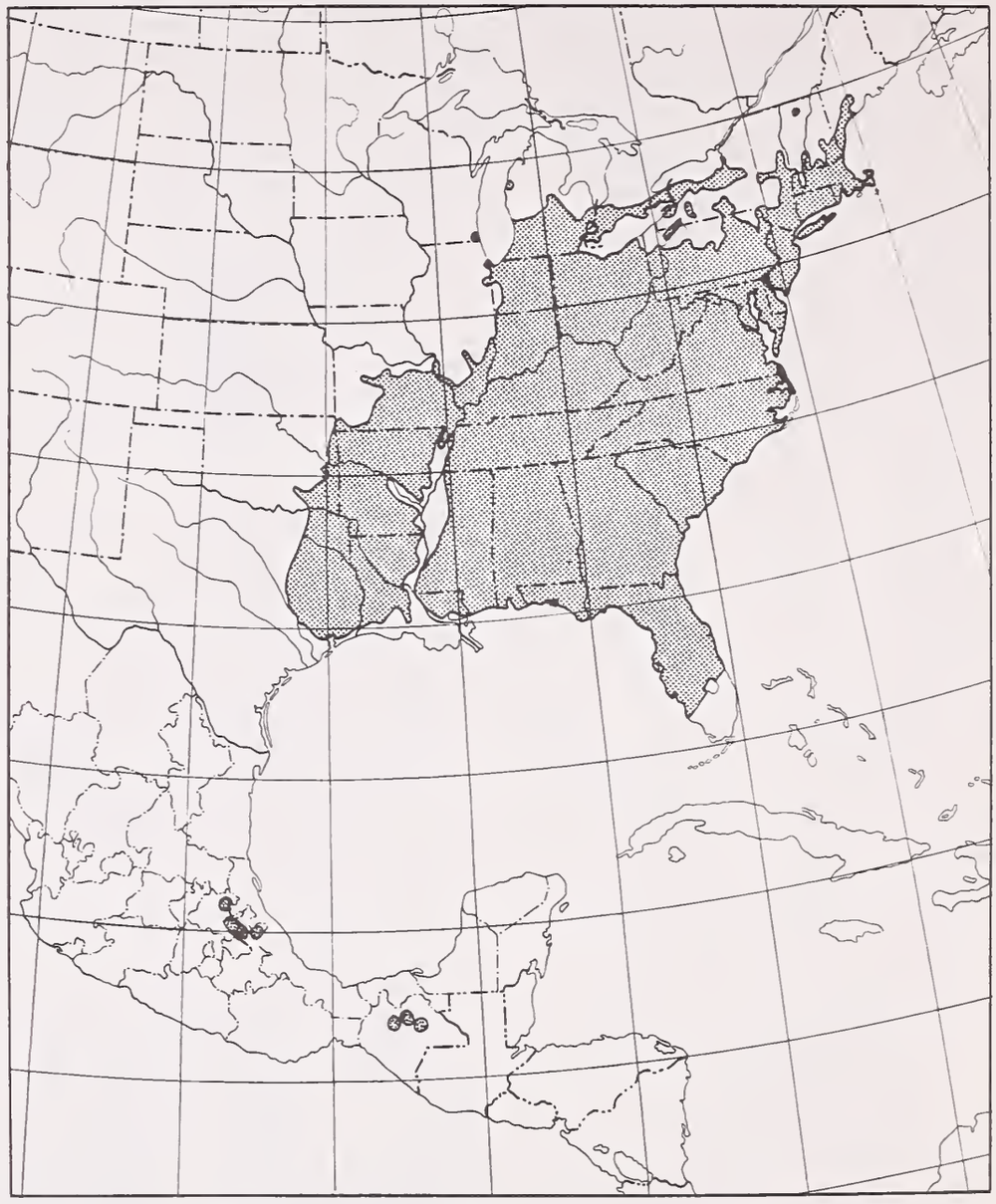


Figure 1.—Natural range of black tupelo. (F-506610)

F-506610

The range of swamp tupelo is limited to Coastal Plain swamps and estuaries from Maryland to Florida, west along the Gulf of Mexico to southeastern Louisiana, and north on the east side of the Mississippi River to southwestern Tennessee. Swamp tupelo is a major member of forest types in the coastal swamps of the lower coastal plains from southeastern Virginia to southern Mississippi. In these areas it is normally found in dense, even-aged stands, but it also frequently occurs in association with cypress, sweetbay, and water tupelo. Throughout its range, swamp tupelo grows in the slackwater areas along minor streams and branch heads, and in low coves and spring seepage areas. Sites favorable for swamp tupelo normally do not dry up during the growing season. The soils range from highly organic mucks to heavy clays and are usually acidic.

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The range of water tupelo extends throughout the Coastal Plains from southeastern Virginia to southern Georgia, and from northwestern Florida along the Gulf of Mexico to southeastern Texas. It extends up the Mississippi Valley as far north as the southern tip of Illinois (fig. 2). Water tupelo is almost certain to be present in the alluvial flood plains of streams and rivers. Occasionally it is seen along the drainages from coastal muck swamps but never in the interior of the swamps. It will make good growth in spring seepage areas where water stands for periods of time. Water tupelo develops best in the bottom lands of the major rivers and large streams in the Southeastern United States and in the large swamps of southwestern Louisiana and southeastern Texas. Soils in these areas range from plastic clays to silt loams. Many sites suitable for water tupelo are dry during the midsummer or fall, but accumulate 3 to 6 feet of water during the winter. Water tupelo may occur in pure stands and in association with cypress.

The range of Ogeechee tupelo is limited to the southern tip of South Carolina, southeastern Georgia, and northern Florida, where the tree occupies the alluvial flats and stream bottoms.

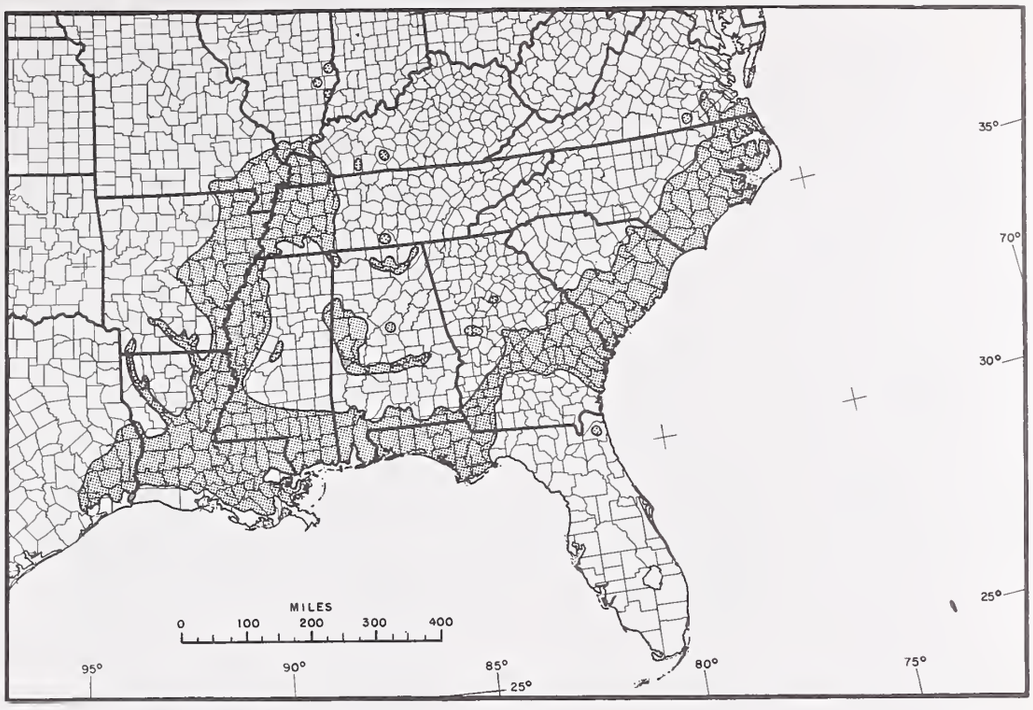

Figure 2.—Natural range for water tupelo. F-506608

Description and Growth

The simple, alternate leaves of black tupelo are linear-oblong to obovate in shape and have an acute apex and wedge-shaped base. The margin is smooth or has a few coarse teeth. The leaves range from 2 to 5 inches in length and ½ inch to 3 inches in width. They are thick and firm and have a dark green upper surface and a smooth, pale-green lower surface. The leaves are usually crowded together at the ends of the twigs (fig. 3). Black tupelo leaves are deciduous, and it is one of the first tree species to show fall color, the upper surfaces turning a bright red or scarlet.

The small flowers of black tupelo appear in axillary clusters in early spring and are greenish white. Male and female flowers normally appear on separate trees. The fruit is a drupe ⅓ to ⅔ inch in length that matures in October. It is dark blue, has a bitter taste, and a solitary light brown stone. There are about 3,300 cleaned seeds per pound. When mature, the winter buds are about 1/4 inch long and are reddish brown.

The bark of black tupelo is distinctive: It is deeply fissured, taking the form of irregularly shaped blocks, and is brown to black in color (fig. 4). The crown of the tree is typically flat-topped with horizontal branches. The tree rarely has a distinctly swollen or flaring butt, and is gradually tapered with an almost cylindrical form.

Swamp tupelo has excellent form—long, straight trunks free of branches. On better sites it will average 2½ to 3 inches of diameter growth in 10 years. Its mature height will exceed 100 feet, and it will reach a diameter above the butt swell of 40 or more inches. In even-aged second growth stands, this moderately tolerant tree is frequently over-topped by its competitors which are less light demanding. Early thinning is required to prevent stagnation and promote good growth. Response to thinning after stagnation is only slight. To maintain a satisfactory growth rate, thinning must be done before stagnation.

Leaves of swamp tupelo are 2 to 4 inches and only ¾ to 1 inch wide. They are simple and alternate and have an oblong to elliptic form with a gradually narrowing base and acute apex. The edge is commonly smooth (fig. 5). The leaves have a yellow-green lustrous upper surface and a paler smooth lower surface that does not have the downy pubescence characteristic of water tupelo. The male and female flowers develop on different trees. The flowers appear when the leaves are almost fully developed. The fruit is a small drupe about ⅓ inch long, is dark blue in color, and will float when partially dry. The terminal winter bud is small, about ⅛ inch long, and is dark reddish brown. On some trees the bark is gray in color, but more generally it is dark reddish brown. The bark is 1 inch

Figure 3.—Leaves and fruit of black tupelo. F-491025

Figure 4.—Bark of black tupelo. F-256569

Figure 5.—Leaves and fruit of swamp tupelo. F-491028

thick and has deep longitudinal furrows (fig. 6). The stem of swamp tupelo is commonly less swollen than water tupelo but tapers more gradually.

Water tupelo, under the best growing conditions, will reach a height of more than 100 feet and a diameter of 3 or 4 feet above the butt swell. On a good site it will grow 2½ to 3 inches in diameter in 10 years if the stand is properly thinned (fig. 7). This tree sprouts readily from stumps (fig. 8). In dense second-growth stands it stagnates like swamp tupelo, and response to thinning is slight if stagnation has been prolonged.

The leaves of water tupelo are simple, alternate oblong-ovate, and commonly long-pointed at the apex. Though normally smooth-edged, they may have slightly toothed margins. Mature leaves have a dark-green, smooth upper surface and a pale-green downy-pubescent lower surface. The leaves range from 5 to 7 inches long and from 2 to 4 inches wide. The petioles are stout, hairy, and are 1 inch to 2½ inches long.

The flowers of water tupelo are similar to those of black tupelo and appear in March and April. Male and female flowers normally appear on different trees. The fruit, a dark purple drupe 1 inch long with conspicuous pale dots, matures in early autumn. The single stone is light brown to nearly white and the fruit will float after it has partially dried. It is dispersed by animals and by water and may remain viable for as long as 2 years. The terminal winter bud is smaller than that of black tupelo; the axillary buds are tiny and appear to be almost embedded in the bark.

The bark is thin, about ¼ inch thick, dark brown to gray in color, and has well-defined longitudinal furrows. The tree has a narrow open crown and a greatly swollen butt that tapers rapidly to a long clear stem.

Ogeechee tupelo is normally a shrub or small malformed tree 25 to 30 feet in height. Young growth closely resembles that of more desirable species.

Common Names

Tupelos probably have more common names than do the members of any similar group of species.

Black tupelo is also known as blackgum, pepperidge, sourgum, tupelo, tupelo-gum, and gum tree.

Swamp tupelo is also known as blackgum, swamp black tupelo, swamp blackgum, and bastard blackgum.

Water tupelo is also known as gum, tupelo, swamp tupelo, swamp-gum, tupelo-gum, bay poplar, and hazel pine.

Ogeechee tupelo is also known as Ogeechee gum, Ogeechee-lime, wild lime tree, gopher plum, white tupelo, sour tupelo-gum, sour tupelo, white tupelo gum, lone tupelo, lime tree, and bee tupelo.

Supply

The current supply of tupelo timber is estimated at about 25.9 billion board feet (International ¼ rule) in trees of sawtimber size, and the total inventory—that is, all trees 5 inches d.b.h. and larger—is estimated to be 10.6 billion cubic feet. In 1970, the reported estimate was 9.75 billion cubic feet. This inventory is mostly in water and swamp tupelo. Slightly more than half of this timber is in North Carolina, Louisiana, and Georgia. The supply of tupelo timber represents about 4 percent of the total timber supply of all kinds in the Southern States.

Figure 6.—Deeply furrowed bark of swamp tupelo. F-491029

Figure 7.—Thinning in an even-aged stand of water tupelo. F-485940

Figure 8.—Water tupelo stump sprouting 2 years after timber cut. F-521067

These estimates, based on the most recent individual State inventories of timber resources conducted by the USDA Forest Service, show that the supply of tupelo growing stocks has increased nearly 1 billion cubic feet in the last decade.

Production

The total yearly cut of tupelo exceeds 250 million board feet, lumber tally. In 1979 about 266 million board feet of tupelo lumber were produced. This production is down approximately 27 percent from the reported production of 363 million board feet in 1965. A small amount of tupelo, equal to about 10 million board feet, is cut into veneer and used in plywood. Current USDA Forest Service resource estimates indicate that growth of tupelo exceeds removal from harvesting by approximately 30 percent.

Characteristics and Properties

Wood of all the tupelos is quite similar in appearance and is difficult to separate by species, even with a microscope. With a specific gravity of 0.45 to 0.50 (green volume—ovendry weight), tupelo wood is moderately heavy. It has relatively long fibers for a hardwood, averaging .08 inch (2.0 mm) in length. The grain is frequently interlocked. The wood has no characteristics odor or taste. Color of the heartwood is brownish gray; the sapwood is lighter. The transition between the heartwood and sapwood is normally gradual. The wood is diffuse-porous; vessels and rays are difficult to distinguish, as are the annual rings.

Tupelo wood tends to warp when dried, especially when plain-sawn. The wood shows a characteristic figure when quarter-sawn. Therefore, about half of all tupelo lumber is quarter-sawn. Both quarter- and plain-sawn lumber can be dried satisfactorily with proper drying schedules, however. While the wood lacks natural durability, it is moderately strong, is easily penetrated by preservatives, and holds paint well. It is considered to be somewhat difficult to glue.

Principal Uses

Large quantities of tupelo are used in the production of manufactured products such as furniture, shipping containers, millwork, and the like. In 1965, tupelo provided about 65 million board feet of lumber for the manufacture of furniture, representing approximately 2 percent of all lumber used in that industry. In the same year, tupelo supplied about 17 million square feet of plywood and 7 million square feet of veneer, representing about 2.5 percent of all plywood and 5 percent of all veneer used by the furniture industry in the United States. Also, about 11 million board feet of tupelo lumber and 5 million square feet of veneer and plywood were used for manufacture of shipping containers. Miscellaneous uses such as cross ties, bridge ties, and crossing planks consumed about 60 million board feet of lumber in 1965.

Tupelo wood is desirable for the manufacture of pulp for paper. Where it is accessible and plentiful, its use for hardwood pulp is probably second only to that of sweetgum.

Limited quantities of tupelo are also used for cigar and tobacco boxes, wood novelties, and factory floors and platforms that are subject to heavy wear.

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